



## COMPARATIVE ADVANTAGE, CROSS-BORDER MERGERS AND MERGER WAVES: INTER- NATIONAL ECONOMICS MEETS INDUSTRIAL ORGANIZATION

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Perhaps the most striking aspect of the current phase of globalization is the increased importance of foreign direct investment (FDI). This is not only true at the global level but also at the regional level. It is clear that the process of economic integration in the European Union has boosted FDI for the EU countries. In the field of international economics, the modeling of FDI has been high on the research agenda in recent years and clear progress has been made in understanding the determinants and effects of FDI (see for instance Barba-Navaretti and Venables (2004) for an overview). The new theoretical insights are, however, not always in line with the facts. One important puzzle in this respect is precisely the fact that economic integration or, in modeling terms, a fall in trade costs has been accompanied by an increase in FDI. From the data we know that so-called horizontal FDI, that is FDI undertaken for market size considerations, is the dominant form of FDI, but theory tells us that a fall in trade costs should go along with a *decrease* in horizontal FDI. Lower trade costs, *ceteris paribus*, make it more profitable for firms to serve foreign markets via exports instead of setting up their own production in these markets.

One way to solve this puzzle is to recognize that the bulk of FDI does not take the form of greenfield investment but, instead, takes place through cross-border mergers & acquisitions (M&A). Tradition-

ally, the topic of M&A has belonged to the domain of industrial organization. But research in this area has so far not been very successful in pinpointing the determinants of cross-border M&A and it has in particular not paid much attention to insights from international economics as to the causes of FDI. It is the goal of this paper to show for the case of cross-border M&A how a “marriage” between international economics and industrial organization can help us improve our understanding of these important phenomena. Based on innovative theoretical work by Peter Neary (2003, 2004), we will illustrate how a key insight from international economics, the concept of *comparative advantage*, can be used to improve our understanding of the main vehicle for FDI, *cross-border mergers*. Our research (Brakman, Garretsen, and van Marrewijk, 2005) shows that firms from sectors in which the country under consideration has a comparative advantage are bound to be engaged in cross-border mergers. We also find that the use of comparative advantage may help us understand the stylized fact that mergers come in waves. One important policy implication of our findings is that more traditional analyses of the effects of economic integration may underestimate its true impact. If, and this is a big if, cross-border M&As improve the efficiency of the firms concerned, economic integration has additional welfare gains over and above the ones (trade creation, improved dynamic efficiency) that are commonly put forward in the literature.

### The importance of mergers & acquisitions<sup>1</sup>

As illustrated in Table 1, cross border M&As are the main driving force behind the surge in foreign direct investment, recently accounting for more than three quarters of total FDI flows. This holds particularly for developed countries, where the share has almost reached 90 percent of the total. It should also be noted that a high share of total M&A activity crosses international borders. For example, during the period 1987 to 1999, which captures most of the so-

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<sup>1</sup> See Brakman, Garretsen, and van Marrewijk (2005) as the general source of the data presented in this article.

Table 1

**Cross-border M&A investment  
(percent of total FDI inflows to the host countries)**

	1987 to 1991	1992 to 1994	1995 to 1997	1998 to 2001
World	66.3	44.6	60.2	76.2
Developed countries	77.5	64.9	85.4	89.0
Developing and transition economies	21.9	15.5	25.8	35.7

Source: Barba-Navaretti and Venables (2004), p.10.

called fourth and fifth merger waves (see below), cross border transactions accounted for about 25 to 30 percent of total M&A activity, both in terms of value and the number of transactions. Again, this holds in particular for developed countries. According to OECD data, the UK and the Netherlands are the leading countries in cross-border M&As, closely followed by Germany and France. At the peak of the so-called fifth merger wave in the late 1990s, for instance, cross-border M&As relative to GDP amounted to 16.3 percent in the UK and 13.7 percent in the Netherlands.

### Our data

A good and extensive data source on mergers and acquisitions is the *Global Mergers and Acquisitions*

*database of Thomson Financial Securities Data* (Thomson, hereafter). This company gathers information on mergers and acquisitions exceeding one million US dollars, its main sources of information being financial newspapers and specialized agencies like Bloomberg and Reuters. Our Thomson data set begins in 1979 and ends in April

2005. After some preliminary investigations, we decided to restrict our analysis to cross-border merger deals in the period 1980 to early 2005 for five active countries, varying in size and location, namely Australia (AUS), France (FR), the Netherlands (NL), the United Kingdom (UK), and the United States (US). This resulted in 11,721 observations, or about 28.5 percent of all cross border mergers and acquisitions in the Thomson database.

As summarized in Table 2, the United States was the most active country involved in mergers & acquisitions (40.3 percent of the acquisitions and 43.7 percent of the targets), closely followed by the UK (39.5 and 27.6 percent, respectively). Note that cross-border M&A deals with acquirer and target located in the same country are possible, for example, when an American firm takes over another

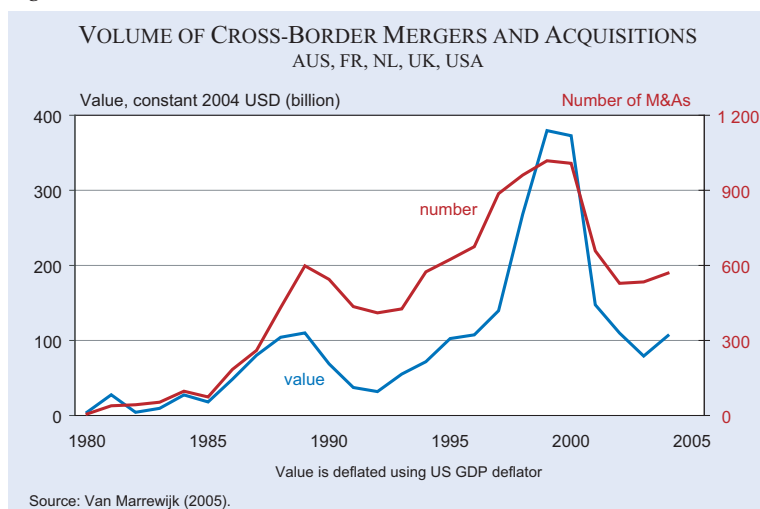
Cross-border M&As: account for 90 percent of developed countries' FDI

Table 2

**Overview of M&As  
Five countries, all sectors, 1980 to 2005**

		Acquirer				
		AUS	FR	USA	UK	NL
No. of deals						
Target	AUS	562	23	388	351	26
	FR	14	223	425	608	74
	US	231	310	2,136	2,229	213
	UK	137	249	1,602	1,095	154
	NL	13	52	178	351	77
Total		957	857	4,729	4,634	544
Percent						
	AUS	4.8	0.2	3.3	3.0	0.2
	FR	0.1	1.9	3.6	5.2	0.6
	US	2.0	2.6	18.2	19.0	1.8
	UK	1.2	2.1	13.7	9.3	1.3
	NL	0.1	0.4	1.5	3.0	0.7
Total		8.2	7.3	40.3	39.5	4.6
Horizontal M&As (2-digit sic level):		5,628 (48.0%)				
100% acquired in M&A		8,487 (72.4%)				
100% owned after M&A		9,007 (76.8%)				
Value of transaction (million \$):						
		mean 186.17				
		median 20.00				
		maximum 60,286.67				

Figure 1



American firm that is active abroad. As indicated in the Table, the median value of an M&A is \$20 million. Note that the distribution of the value of deals is rather skewed. The maximum value, for example, was more than \$60 billion, resulting in an average value per transaction of about \$186 million, much higher than the \$20 million median value. In most cases (72.4 percent), full ownership is acquired with the transaction, or at least the transaction leads to full ownership afterwards (76.8 percent). Moreover, in almost 50 percent of all cases a similar type of firm is acquired, indicating that we are dealing with horizontal M&As. For the period 1985–2004, the average annual number of deals for our five countries was 570 and their annual value was \$122 billion.<sup>2</sup>

### Mergers & acquisitions: waves

There is an important stylized fact as to the development of M&A activity over time: they come in waves. Figure 1 gives an impression of the importance of the ‘wave’ phenomenon for our five countries. Since the value of the deals is measured in current US dollars, we use the American GDP deflator to adjust all values to constant 2004 dollars. It is common to distinguish between five merger waves during the 20th century, three of which are recent. The third wave took place in the late 1960s to early 1970s, the fourth wave ran from about the mid 1980s until 1990, and the fifth wave started around 1995 and ended in 2000 with the collapse of the “New Economy”. The waves are illustrated in Figure 1 for

both the number of deals and their value in the last two waves. The first peak (of 1989) was almost 600 deals with a value of \$110 billion. The second peak (of 1999) was 1018 deals with a value of \$380 billion. When compared to the average of the period, it is clear that the most recent wave reached unprecedented levels in terms of number of deals and value. During the fifth merger wave, European firms engaged in a number of (mega) M&As with the cross-border take-over of Mannesmann (Germany) by Vodafone

(UK) for \$172 billion in 2000 as the largest deal in Europe to date (not included in Table 2). Merger waves are positively correlated with increases in share prices, price-earnings ratios, and the overall business cycle. In terms of standard M&A motives (see below), it is rather difficult to explain the wave phenomenon.

### Modeling difficulties

Despite the obvious quantitative importance of cross border M&As, the reasons underlying these transactions are still not well understood. Various motives for M&As can be distinguished in general. In the industrial organization literature two basic motives stand out: an efficiency motive and a strategic motive. Efficiency gains arise because takeovers increase synergy between firms that increase economies of scale or scope. Strategic gains arise if M&As change the market structure and thus a company’s competitive position and profit level. The main problems with these explanations is that they are (i) based on *partial equilibrium* models, taking demand and income levels as given, and (ii) do not deal explicitly with *cross-border* M&As. This therefore provides a fundamental but also limited understanding of this form of takeover, as cross-border mergers are related to economy-wide shocks, such as (European) economic integration, changes in the legal and regulatory environment, or possible asymmetric business cycles. These factors change the position of one country relative to another, pointing in the direction of general equilibrium trade models and thus in the direction of international economics. Standard trade theory, however, is not well-equipped to explain M&As since it often rules out strategic

<sup>2</sup> Ignoring the first four years in which the data set is incomplete.

interaction between firms.<sup>3</sup> As argued by economists like Peter Neary, Avinash Dixit and Joe Stiglitz, this not only holds for the neoclassical perfect competition models, but also for the models based on increasing returns to scale and monopolistic competition.

### The Neary model

A recent theoretical model developed by Peter Neary (2003, 2004), combines general equilibrium trade theory with imperfect markets and strategic behavior of firms to determine cross-border M&As. It therefore is an attempt to combine international economics and industrial organization. This attempt is not only to be welcomed from the perspective of industrial organization because it allows for the linkage between cross-border M&As, see above, but it is also to be welcomed from the perspective of international economics because there, as we explained in our introduction, cross-border M&As, the main vehicle for FDI, are a blind spot.

The attempt by Neary to combine general equilibrium trade theory with imperfect markets and strategic behavior of firms is *a priori* a difficult one because pricing decisions of large firms not only directly affect profits, but their market (pricing) behavior also affects national income and the real income of their customers. Furthermore, large firms can also influence factor prices. All these effects combined have to be taken into consideration by firms when making their decisions. Without going into the details of the Neary model, the central idea can be described with the help of the equation below, providing the gain to a foreign firm if it takes over a domestic firm (an asterisk indicates foreign variables):

$$\text{Gain} = \underbrace{[\pi^*(n-1, n^*) - \pi^*(n, n^*)]}_{A: \text{profitability gain}} - \underbrace{\pi(n, n^*)}_{B: \text{takeover costs}}$$

The term A reflects the change in profits ( $\pi$ ) of the foreign firm when the number of domestic firms is reduced by one (from  $n$  to  $n-1$ ): less competition increases profits. The term B reflects the price the foreign firm has to pay for taking over the domestic firm, as the initial owners have to be compensated

for their profit loss. Intuitively, the equation indicates that if the foreign acquirer is more efficient than the domestic target, the gain in profits (the term A) may be high enough to cover the cost of a takeover (the term B). Note, in particular, that if the domestic target firm has high costs its profit level will be low, and so will be the cost of acquiring this firm (the term B). Also note that the cost difference should not be too large, because then there is no firm to take over. We relate the cost differences between firms in this international setting to the well-known concept of revealed comparative advantage (see below). The first testable hypothesis is therefore that M&As tend to take place in sectors where the acquiring firm has a strong comparative advantage. The Neary model is also able to explain merger waves. Again looking at the equation, it is evident that foreign firms prefer other firms to move first in taking over a domestic firm, as this increases their profits (term A) without the need to incur the costs (term B). Using a game-theoretic setting, Neary translates these forces into a theory of merger waves, leading to a second testable hypothesis.

### Mergers and acquisitions and comparative advantage

To get a first glimpse of the empirical relevance of the above two implications of the model, we have to link the Thomson data set, introduced above, to international trade data to determine a country's strong sectors. To do this, we identified 20 different 2-digit sectors in the data, for which the Thomson data can be adequately linked to the trade data (reducing the number of available observations to 3,462 M&As). For each country, each sector, and each year we then calculated the Balassa index, an index of (revealed) comparative advantage at the sector level, equal to the share of a country's exports in a certain sector relative to that same share for a group of reference countries (all OECD countries). The index is a positive number, that is the higher the stronger this particular sector is for the country in question. If the Balassa index exceeds unity, the country is said to have a *revealed* comparative advantage in that sector.

Figure 2 indicates that M&As do tend to take place in strong export sectors by comparing the share of sectors where the Balassa index exceeds unity in case of a merger or takeover with a relevant standard or benchmark distribution. For the period 1980 to 2000, the latter shows the share of the 20 sector-

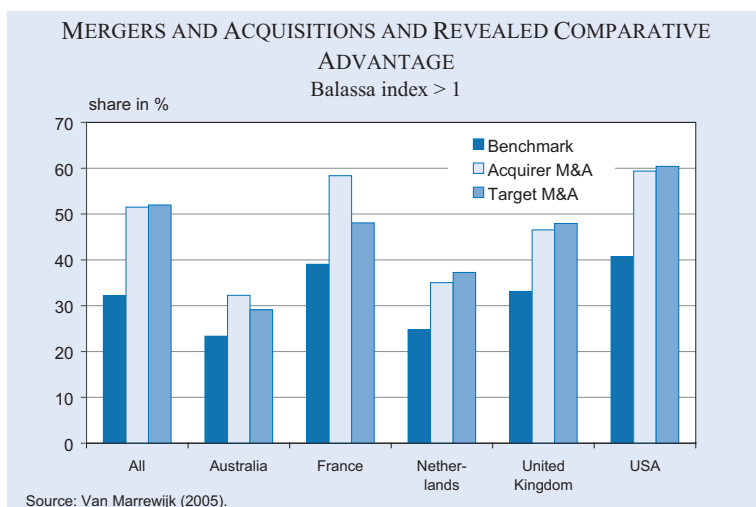
The Neary model combines trade theory with imperfect markets and the strategic behavior of firms

<sup>3</sup> See, for example, the contributions of Peter Neary, Avinash Dixit and Joe Stiglitz in: Brakman and Heijdra (2004).

year-country observations with a Balassa index higher than one. For example, the first column indicates that for all countries, all years, and all sectors 32.2 percent of the observations were larger than 1 (676 out of 2,100 observations). We do the same for the acquirer and the target in case of a merger or takeover. In each case, we determined whether or not the sector involved in a merger or takeover had a revealed comparative advantage (Balassa index above one) both from the acquiring firm's (sector-country-year) and the target firm's (sector-country-year) perspective. As Figure 2 illustrates, for all mergers and acquisitions taken together, the acquiring firm was active in a sector with a revealed comparative advantage for more than 50 percent of the observations, significantly more often than in the benchmark case. Figure 2 clearly illustrates that M&As tend to take place in strong export sectors, with up to 60 percent of the cases with a revealed comparative advantage for the United States. In our underlying analysis (Brakman, Garretsen, and van Marrewijk, 2005) we show that these first indications of Figure 2 are confirmed by more rigorous testing. The same holds true for the idea that cross-border mergers occur in waves, recall Figure 1. In particular we find that:

- Australia, France, and The Netherlands, other things being equal, are less active in cross-border mergers & acquisitions than the UK and the USA.
- Mergers and acquisitions are undertaken by 'strong' firms, that is firms active in sectors with a revealed comparative advantage as measured by the Balassa index, in accordance with the first hypothesis that follows from Neary's model.
- Waves play an important role in cross-border merger and acquisitions, this is also in accordance with the Neary model and sector-waves occur with a two-year horizon.

Figure 2



Brakman, S., H. Garretsen, and C. van Marrewijk (2005), "Cross-border Mergers & Acquisitions: on revealed comparative advantage and merger waves," CESifo Working Paper No. 1602.

Neary, J.P. (2003), "Globalization and market structure," *Journal of the European Economic Association* 1: 245–271.

Neary, J.P. (2004), "Cross-border mergers as instruments of comparative advantage," CEPR-Discussion Paper Series, No. 4325, London.

Marrewijk, C. van (2005), "An overview of cross-border Mergers & Acquisitions for five countries," *FM Corporate* 1: 18–19.

M&As tend to take place in strong export sectors

## References

Barba-Navaretti, G., and A.J. Venables (2004), *Multinational firms in the world economy*, Princeton University Press, Princeton.

Brakman, S., and B.J. Heijdra, eds. (2004), *The Monopolistic Competition Revolution in Retrospect*, Cambridge University Press, Cambridge.